

### REMARKS

Claims 6-9 remain in this application. Claims 6-9 have been amended.

Claims 6-9 were rejected under 35 U.S.C. Section 112, first and second paragraphs. Similarly, the specification was objected to as failing to provide an antecedent basis for the claimed subject matter. Applicant has amended claims 6-9 with a view towards overcoming these rejections and/or provides the following arguments in relation to these rejections.

First, applicant has amended the claims to change all references to doctor “foils” and “foil” holders to doctor “slats” and “slat” holders. Applicant hereby notes that this change is solely to provide consistency between the specification and the claims. Applicant has been using the term doctor “slat” interchangeably with the term doctor “foil.” A doctor “slat” is in fact the same as a doctor “foil.” In fact, applicant has referred to the effect the slat has on the suction roll as the “foil effect” (see second paragraph beginning on page 3 of the specification). This has led applicant to refer to the doctor “slat” as a doctor “foil.” Applicant has decided that it is best to keep the language used in the specification and to alter the claims to be consistent with the specification. This is not any change in the substance of the claims.

Second, applicant has eliminated the word “sharp” before angle in claim 6 so that the claim now only refers to the doctor slat contacting the suction roll at an angle. Applicant agrees that the reference to “sharp angle” may be indefinite and/or is not explicitly disclosed in the specification. Applicant, however, argues that reference to the doctor slat contacting the suction roll at an angle is disclosed in the specification in at least Fig. 1. Further, one skilled in the art knows that doctors contact a suction roll at an angle. Even more, one skilled in the art knows that doctor slats contact suction rolls at small (hence “tight”) angles; this much is clear from prior art such as Kivimaa. Hence, although the reference to “sharp angle” in claim 6 may have been indefinite and/or not explicitly supported by the specification, one skilled in the art knows that doctor slats contact suction rolls at angles between 2° - 10°, which are reasonably referred to as “sharp” angles.

Reference to “sharp angle” was not addition of new matter and deletion of the word “sharp” is only for purposes of clarifying the claims with respect to the explicit wording of the specification.

Third, in regards to the element in claim 6 that the “doctor slat contact angle [is] smaller than the doctor blade contact angle,” applicant argues that this limitation is disclosed in the specification and is described in a way that reasonably conveys to one skilled in the art that the inventor had, at the time the application was filed, possession of the claimed invention. The specification clearly points out that the invention comprises a doctor slat in combination with a doctor blade. Further, the drawings clearly show a doctor slat and a doctor foil. Next, anyone skilled in the art, as evidenced by prior art such as Kivimaa and Boucher, knows that doctor slats must contact a suction roll at an angle exclusively between 2° and 10° while doctor blades contact a suction roll at much greater angles, usually around 30° but never less than even 20°. Doctor slats and doctor blades differ in this and other distinct ways that are known to those skilled in the art as evidenced here and further below. Hence, one skilled in the art, viewing the specification, would know that doctor slats contact at smaller angles than doctor blades and that the applicant was in possession of the invention as claimed. Finally, the specification provides antecedent basis for this claim language in the inherent differences between doctor slats and doctor blades known to those skilled in the art.

In further response to the Office Action dated March 12, 2003, applicant respectfully requests reconsideration of claims 6-9 as amended.

The examiner has rejected claims 6-9 under 35 U.S.C. Section 103(a) as being unpatentable over applicants’ admission of prior art at page 1 of the specification (AAPA) with Kivimaa et al., and further in view of Boucher, if necessary further with Turtinen et al. and/or WO ‘279. Applicant respectfully traverses this rejection. Kivimaa does disclose a “doctor slat.” It should be noted, however, that a doctor slat sucks water out of and off a suction roll. A doctor slat is thus different than a “doctor blade,” which scrapes water from the surface of a suction roll. This difference is a result of the fact that

a doctor slat contacts a suction roll at a small angle in the range of  $2^{\circ}$  -  $10^{\circ}$  (see Kivimaa, lines 37-39 of column 1), such arrangement creating a suction (or “foil”) effect, while a doctor blade contacts a suction roll at a much greater angle of about  $30^{\circ}$  (see Boucher), such arrangement not creating a suction effect. Applicant at this time desires to clarify its prior remarks regarding the blade angles disclosed in Boucher. Applicant agrees that Boucher teaches that its two doctor blades are at angles of  $30^{\circ}$  and  $45^{\circ}$  to the perpendicular through the roll, thus creating a spacing of  $15^{\circ}$  between the blades. Any comment by applicant to the contrary was unintended. What applicant was attempting to point out is that the contact angle of the blade to the roll (the angle formed by the blade and the tangent of the roll extending from the contact point of the blade on the roll) is  $30^{\circ}$  in Boucher (Fig. 3 and lines 43 and 64 of column 3 of the specification) and in other prior art varies from  $25^{\circ}$  to  $55^{\circ}$ . In any event, the contact angle of a blade is never less than even  $20^{\circ}$  and nowhere approaches the maximum angle of  $10^{\circ}$  for a doctor slat, exemplifying that the difference between the two devices is well-known in the art.

Continuing the argument that “doctor blades” are different than “doctor slats,” Kivimaa does refer to what applicant has called a “foil”/“slat” as a doctor “blade,” but at the same time Kivimaa also discloses that its “blade” has a “slat face.” This illustrates that the device in Kivimaa is not in fact a “blade” as one would think of a blade but really a “slat” or “foil”. Applicant has decided to refer to its “doctor slat” as such in order to distinguish the fact that the “blade” of Kivimaa and the “slat” of applicant’s device are clearly distinct from a conventional doctor “blade” in both their shape and effect. It is confusing to refer to a “doctor slat” as a “doctor blade.” That being said, applicant argues that while Kivimaa discloses that a doctor slat can remove more water from a suction roll than a doctor blade, Kivimaa is silent as to the fact that some of the water sucked out of the suction roll by the slat does not fall off the roll but is sucked back into the suction roll. Due to this phenomenon, Kivimaa alone does not remove all of the water from the suction roll. Further, a doctor slat has the benefit of bringing fibers and filler substances to the surface of the holes of a suction roll, but a doctor slat alone cannot remove these unwanted

waste products. They are sucked back into the suction roll the same way some of the excess water is.

Applicant further agrees that double doctor blades have been shown in the prior art such as Boucher and Turtinen. Applicant, however, respectfully disagrees with the examiner's argument that it is prima facie obvious to use the doctor slat of Kivimaa in place of one of the doctor blades in a double doctor blade device such as Boucher. To begin, a doctor slat and a doctor blade are two very different types of devices, as illustrated above. These devices have never been combined by persons skilled in the art and there is no hint present in the prior art that would teach or suggest replacing a doctor blade of a double doctor blade device with a doctor slat. The prior art merely teaches using a doctor slat alone to remove water or to use two doctor blades in combination. As further evidence of this, there is no available space in the construction of the Kivimaa device to add a conventional doctor blade and there is no teaching in this disclosure that adding a doctor blade would improve performance. Moreover, applicant has discovered that using a doctor slat in combination with a doctor blade produces results that using either alone cannot achieve. A doctor slat alone can suck water to the surface of a suction roll and waste material to the top of the holes of a suction roll, but not all the water that comes to the surface falls off the roll. This water and the waste material are re-sucked up into the suction roll. Doctor blades can remove surface water from a suction roll, but they cannot suck up water and waste material from the holes of a suction roll. Combining the two solves these problems. The doctor slat sucks water and waste to the surface of the roll, and the subsequent doctor blade scrapes both water that doesn't fall off the surface of the roll at the slat and waste off the roll. Further, as argued in applicant's previous response, double doctor blade systems employed in the prior art have the important deficiency of functioning poorly when the speed of the roll is increased. Attempts have been made to solve this problem in double doctor blade devices but have failed. Applicant has discovered, however, that replacing the first doctor blade of a double doctor blade system with a doctor slat greatly and heretofor unexpectedly reduces the deficiencies of a double doctor blade

system. Hence, applicant's invention produces better results than any of the other prior art devices, including increased water removal, increased removal of waste fibers and filler substances, better efficiency at increased suction roll speeds, and because of these results, better quality of the end paper product.

Applicant further disagrees with the examiner's argument that determining the spacing between the doctor slat and the doctor blade is *prima facie* obvious to one skilled in the art. Applicant has disclosed in its specification the that angle between the points of contact of the doctor slat and the doctor blade extending from the center of the suction roll ( $\alpha$  in Fig. 1) can be  $15^\circ - 70^\circ$  but preferably is  $20^\circ - 40^\circ$ . Boucher discloses that the angle between two doctor blades is  $15^\circ$  but can be varied so long as sufficient spacing is maintained between the two doctor blades. Kivimaa itself does not speak to the spacing of a doctor slat and a doctor blade because Kivimaa only involves a single doctor slat. It would not be obvious to one skilled in the art to determine the spacing of  $20^\circ - 40^\circ$  for a doctor slat and a doctor blade. Firstly, in all conventional double doctor blade constructions the spacing is smaller than  $20^\circ$ . Secondly, a larger spacing has not been viewed as advantageous because there is usually a lack of space for these devices and one usually must conserve the available space. Thirdly, a spacing of  $15^\circ$  would not work well in applicant's invention because at a point  $15^\circ$  from the doctor slat, water and fibers are still coming up through the holes of the suction roll due to the slat effect of the doctor slat. Therefore, the spacing between the doctor slat and the doctor blade must be greater than the conventional distance of  $15^\circ$ . Further, the spacing in the present invention is optimally no greater than  $40^\circ$  because as the distance increases past a certain point, water and waste begin to be re-sucked up into the suction roll and the advantageous benefits of having a doctor blade downstream from a doctor slat are lost. This is not obvious from the prior art because even Kivimaa, as noted above, does not disclose, teach nor suggest the fact that some of the water (and fiber materials for that matter) do not fall off the suction roll but are instead sucked back into the suction roll. As such, Kivimaa does not suggest to one skilled in the art the circumferential distance from the doctor slat this occurs.

Finally, applicant disagrees with the examiner's argument that the use of a trough in the present invention is prima facie obvious. Kivimaa does teach the use of a trough below a doctor slat. Kivimaa, however, does not teach the use of a trough above the doctor slat (see "22" in Fig. 1). Further, a trough is not commonly used with doctor blades, especially because doctor blades do not allow for the collection of water due to fuming at higher suction roll speeds. In the present invention, a trough is used to collect water and fibrous waste material that is scraped from the roll by the doctor blade after these substances have been raised to the surface by the doctor slat. There is no suggestion for this in the prior art because doctor blade systems have not allowed for the collection of materials. Furthermore, Kivimaa gives no reason for one skilled in the art to need to collect substances after they had passed the doctor slat.

Applicant submits that for the reasons stated above, the claims are not anticipated by the prior art and are therefore patentable.

In further support of the patentability of applicants' claimed invention, attached hereto is the declaration of expert Juhani Vestola who finds that none of the cited references teach or suggest applicant's claimed invention. Applicants' respectfully request consideration of Mr. Vestola's declaration.

This request for reconsideration is felt to be fully responsive to the comments and suggestions of the examiner and to present the claims in better condition for allowance. Favorable action is requested.

Respectfully submitted,

Tuomo Juvakka et al.

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A handwritten signature in dark ink, appearing to read "Chris J. Fildes", is written over a horizontal line.

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**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

**In the claims:**

Claims 6-9 have been amended as follows:

6. (Amended) A doctoring device adapted for use with a paper machine suction roll having a suction roll axis of rotation, said doctoring device comprising:

a doctor blade holder;

a doctor blade fixed on said blade holder, said doctor blade having an edge against said suction roll and contacting said suction roll at an angle disposed relative to a tangent of said suction roll at the point of contact;

a doctor [foil]slat holder;

a doctor [foil]slat connected to said [foil]slat holder, said doctor [foil]slat having an edge in urged engagement with said suction roll through a foil effect and contacting said suction roll at an [sharp] angle disposed relative to a tangent of said suction roll at the point of contact;

said doctor [foil]slat contact angle being smaller than said doctor blade contact angle;

an angle defined by a first radius extending from the suction roll axis of rotation to the point of contact with said doctor blade and a second radius extending from the suction roll axis of rotation to the point of contact with said doctor [foil]slat being in the range of 15 degrees to 70 degrees;

said doctor blade being circumferentially disposed along said suction roll downstream of said doctor [foil]slat in a direction of rotation of said suction roll; and

a frame spacedly mounting both said doctor blade and said doctor [foil]slat;

said frame having a trough formed therein which collects water that has been drawn onto the surface of said suction roll by said doctor [foil]slat.

7. (Amended) The doctoring device of claim 5, wherein said [foil]slat holder of the doctor [foil]slat is detachably fitted to said frame.

8. (Amended) The doctoring device of claim 5, wherein said doctor [foil]slat is trapezoidal in cross-sectional shape and a base of said doctor [foil]slat is in contact with said suction roll.

9. (Amended) The doctoring device of claim 5, wherein said doctor [foil]slat is made of plastic.